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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,151	02/14/2001	Ralph E. Frazier	8605	2317

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EXAMINER	
YIGDALL, MICHAEL J	
ART UNIT	**PAPER NUMBER**
2122	

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/782,151	FRAZIER, RALPH E.	
	Examiner	Art Unit	
	Michael J. Yigdall	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2004 and 25 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 22, 2004 has been entered.

2. Claims 1-20 are pending and have been examined.

Response to Arguments

3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant contends that neither Bishop nor Barritz teach that a history of operating system events, organized and stored as scheduling information, includes indications of relative priorities of programs and tasks, transfers of control from lower priority to higher priority tasks and tasks waiting for execution at the occurrence of each operating software event (see page 9, bottom). However, the combination of Bishop, Barritz, Farrell and Yamagishi teaches these features, as set forth in the claim rejections below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,049,798 to Bishop et al. (art of record; hereinafter "Bishop"), in view of U.S. Pat. No. 5,590,056 to Barritz (art of record; hereinafter "Barritz"), in view of U.S. Pat. No. 5,247,675 to Farrell et al. (hereinafter "Farrell"), and in view of U.S. Pat. No. 5,870,604 to Yamagishi (art of record; hereinafter "Yamagishi").

With respect to claim 1 (currently amended), Bishop discloses a method of capturing operating software scheduling information during execution of operating software (see the abstract, which shows capturing internal resource information such as CPU and memory availability or utilization, i.e. scheduling information, in real-time, i.e. during execution of the operating software), the method comprising the steps of:

(a) compiling operating software scheduling information capture software as part of the operating system (see column 11, lines 1-4, which shows a service of the operating system used for capturing event traces of process activity, i.e. scheduling information; the software is inherently compiled prior to its execution).

Although Bishop discloses recording the data for a certain amount of time in order to provide past records, i.e. a history of events (see column 22, lines 18-22), and discloses identifying each task by process ID and process name (see FIG. 13A), Bishop does not expressly disclose the limitation wherein the operating software scheduling information capture software is operative to record a history of the operating software events as they occur, information related to the history being organized and stored as operating software program scheduling information

relating to interactions between the operating system software and each of the programs and tasks managed by the operating system software.

However, Barritz discloses monitoring events as they occur and recording an event history log (see FIG. 5 and column 6, lines 54-57), in which the recorded information comprises job-scheduling information for each module or task (see column 6, lines 58-64), for the purpose of identifying software usage patterns (see column 2, line 63 to column 3, line 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the capture system of Bishop with the event history features taught by Barritz, for the purpose of enabling the identification of software usage patterns.

Although Bishop discloses monitoring and capturing the information to improve the efficiency of a computer system (see column 3, lines 12-33), Bishop does not expressly disclose the limitation wherein the scheduling information includes indications of relative priorities of programs and tasks.

However, Farrell discloses scheduling information indicating the relative priorities of threads or tasks (see thread state descriptor 19 in FIG. 2, and column 4, line 62 to column 5, line 12), which is used to optimize execution (see column 2, lines 19-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the information captured by Bishop with the relative priorities of programs and tasks, as taught by Farrell, in order to further improve execution efficiency.

Bishop further discloses the limitation wherein the scheduling information includes indications of transfers of control from lower priority to higher priority tasks (see FIG. 13A,

which shows trace records for process switches, i.e. transfers of control among tasks, and column 10, lines 62-67, which shows that the tasks have lower and higher priority levels).

Although Bishop discloses monitoring and capturing the information to improve the efficiency of a computer system (see column 3, lines 12-33), Bishop does not expressly disclose the limitation wherein the scheduling information includes indications of tasks waiting for execution at the occurrence of each software event.

However, Yamagishi discloses scheduling information indicating the number of jobs or tasks waiting for execution (see operation status table 9 and heading 92 in FIG. 3). A CPU monitor captures the information from a job scheduler (see column 3, lines 59-65) to distribute the load among processors, thereby improving efficiency (see column 2, lines 36-39).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the information captured by Bishop with the tasks waiting for execution, as taught by Yamagishi, in order to further improve execution efficiency.

Bishop further discloses the steps of:

(b) invoking operating software scheduling information capture (see column 20, line 55 to column 21, line 4, which shows a procedure for invoking the capture of the data); and

(c) recording operating software scheduling information (see column 22, lines 18-22, which shows recording the data for a certain amount of time).

With respect to claim 2 (original), Bishop further discloses the limitation wherein the operating software scheduling information capture procedure is invoked on an operating software task switch (see column 14, lines 14-15 and line 55 to column 15, line 11, which shows

that mode switches and thread dispatches, i.e. task switches, can invoke the capture of scheduling information).

With respect to claim 3 (original), Bishop further discloses the limitation wherein the operating software scheduling information recorded includes information updated or maintained by the operating software in relation to the scheduling of a program (see FIG. 13A, which shows trace records that include execution time and interrupt time, information maintained by the operating system in relation to scheduling).

With respect to claim 4 (original), Bishop in view of Barritz, Farrell and Yamagishi further discloses the limitation wherein the operating software scheduling information recorded includes task identification, task priority, and task run-time length (see Bishop, FIG. 13A, which shows trace records that include the process ID, i.e. task identification, and the execution time, i.e. run-time length; see also Farrell, FIG. 2, which shows a thread state descriptor that includes the thread or task priority).

With respect to claim 5 (original), Bishop in view of Barritz, Farrell and Yamagishi further discloses the limitation wherein the operating software scheduling information includes a task waiting count (see Yamagishi, FIG. 3, which shows an operation status table that includes the number of jobs waiting for execution, i.e. a task waiting count).

With respect to claim 6 (original), Bishop further discloses the limitation wherein the operating software scheduling information is recorded to a ledger (see column 20, lines 36-37 and 50-52, which shows that the data is initially recorded to a buffer or ledger).

With respect to claim 7 (original), Bishop further discloses the limitation wherein the ledger is at least one of a circular or fixed length ledger (see column 21, lines 23-26, which shows that data is discarded from the pipe if it is not read quickly enough, i.e. because the buffer is a circular ledger having a fixed length).

With respect to claim 8 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the number of program schedules, program preempts, and interrupts (see column 14, lines 14-15 and 35-45, which shows that interrupts are recorded).

With respect to claim 9 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the highest priority attained, program identity, and length of run-time (see column 21, lines 49-52, which shows that the process name, i.e. the program identity, is included in the captured scheduling information).

With respect to claim 10 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the lowest priority attained, program identity, and length of run-time (see column 21, lines 49-52, which shows that the process name, i.e. the program identity, is included in the captured scheduling information).

With respect to claim 11 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the number of times in the idle loop and length of run-time (see FIG. 13A, which shows trace records that include the execution time, i.e. the length of run-time).

With respect to claim 12 (original), Bishop further discloses the limitation wherein the scheduling information includes a sequential record of at least one of scheduled programs, priorities, and events (see column 15, lines 54-64, which shows that events are matched with timing information to compose a sequential record of events).

With respect to claim 13 (original), Bishop in view of Barritz, Farrell and Yamagishi further discloses the limitation wherein the scheduling information includes at least one of the number and identity of programs waiting to run (see Yamagishi, FIG. 3, which shows an operation status table that includes the number of jobs waiting to run).

With respect to claim 14 (original), Bishop further discloses the limitation wherein the operating software scheduling information capture is invoked on an event occurrence (see column 14, lines 14-15 and 55-60, which shows that events such as a mode switch can invoke the capture of scheduling information).

With respect to claim 15 (currently amended), the limitations recited in the claim are analogous to those of claim 1 (see the rationale applied to claim 1 above).

With respect to claim 16 (original), Bishop further discloses the limitation wherein said operating software scheduling information capture software is not resident on an external device (see column 4, lines 32-34, which shows that the software can be internal to the system, and column 22, lines 59-63, which shows that external hardware is not needed).

With respect to claim 17 (original), Bishop further discloses the limitation wherein said operating software scheduling information capture software is not a separate task scheduled by an operating software scheduler (see column 11, lines 1-10 and 30-35, which shows that the information capture is performed by a device driver, i.e. not by a separate task scheduled by a operating software scheduler).

With respect to claim 18 (currently amended), the limitations recited in the claim are analogous to those of claim 1 (see the rationale applied to claim 1 above). Bishop further discloses a processor for receiving and transmitting data (see CPU 190 in FIG. 14) and a memory coupled to the processor (see RAM 194 in FIG. 14), the memory storing instructions to be executed by the processor.

With respect to claim 19 (original), Bishop further discloses the limitation wherein said operating system scheduling information capture software is internally processed on said processor (see column 4, lines 32-34, which shows that the software can be internal to the system).

With respect to claim 20 (original), Bishop further discloses the limitation wherein said operating software scheduling information capture software is not a separate task scheduled by an operating software scheduler (see column 11, lines 1-10 and 30-35, which shows that the information capture is performed by a device driver, i.e. not by a separate task scheduled by a operating software scheduler).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. U.S. Pat. No. 5,168,566 to Kuki et al. discloses a system for control of prioritized task execution. U.S. Pat. No. 6,148,322 to Sand et al. discloses a system for executing multiple tasks with varying priorities. U.S. Pat. No. 4,145,735 to Soga discloses a monitor for priority levels of tasks.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Yigdall whose telephone number is (703) 305-0352. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MY

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